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Transport of liquid hydrocarbons in a leached chernozem

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Abstract

Transport of the mixture of four liquid hydrocarbons in clay loamy leached chernozem was studied in soil-packed columns with natural bulk density in order to simulate primary (imbibition of hydrocarbons) and secondary (redistribution of hydrocarbons under percolation with water) contamination conditions at two initial soil moisture levels (air-dry soil and the field capacity). A limited imbibition of hydrocarbons into the soil at the field capacity was revealed; in the air-dry soil, the drainage of hydrocarbons took place at their contents exceeding the soil retention capacity. The depth of the hydrocarbon downward penetration under secondary contamination (after 7 months) was slightly higher as compared to the primary contamination and increased with the increasing initial (before contamination) moisture content in the soil. The contributions of sorption and natural degradation of hydrocarbons were different in the air-dry leached chernozem and in that initially moistened to the field capacity.